CLAIMS

What is claimed is:

1. An electronic circuit for adding reverberation effects to an audio signal produced from an external high impedance source and passing the reverberated audio signal at a predetermined impedance for input into an external sound device, said electronic circuit comprising, in combination:

a pre-amplifier/driver circuit having a first operational amplifier coupled to a second operational amplifier, each operational amplifier having inverting and non-inverting inputs and an output, each of said outputs comprising a negative feedback loop coupled to said inverting input and shunted to ground for setting a predetermined gain at each of said outputs, said non-inverting input of first operational amplifier having an input jack for receiving therethrough the audio signal produced from the external high impedance source;

a spring reverberation device having an input coupled to said output of second operational amplifier and an output for passage of a reverberated, low impedance signal;

a recovery amplifier circuit comprising a single operational amplifier having an inverting input for receiving the reverberated, low impedance signal and a non-inverting input shunted to ground and an output comprising a negative feedback loop coupled to said inverting input for setting the reverberated, low impedance signal at a predetermined gain and impedance for input into the external sound device; and

a power supply circuit having means for switching between a dc voltage source and an ac voltage source most suitable for powering said first and second and single operational amplifiers.

2. An electronic circuit as set forth in claim 1, wherein said input jack comprises a reverberation effects bypass for maintaining the integrity and impedance of the audio signal produced by the external high impedance source for direct input into the external sound device.

3. An electronic circuit as set forth in claim 1, wherein said non-inverting input of first operational amplifier comprises a switch for controlling the audio signal input and a path to ground comprising resistive capacity for maintaining an impedance level into said first operational amplifier and keeping the external high impedance source from being loaded.

4. An electronic circuit as set forth in claim 1, wherein said negative feedback loop of first operational amplifier comprises a 50K linear potentiometer having variable resistive capacity to variably adjust gain of the audio signal and establish low impedance at said output of first operational amplifier.

5. An electronic circuit as set forth in claim 1, wherein said negative feedback loop of single operational amplifier comprises a 100K linear potentiometer having variable resistive capacity to variably adjust the audio signal's gain and impedance at said output of single operational amplifier prior to being fed into the external sound device.

6. An electronic circuit as set forth in claim 1, wherein said output of first operational amplifier is coupled to said non-inverting input of second operational amplifier having a filter coupled therebefore for blocking passage of dc signals while allowing passage of the audio signal into said second operational amplifier, said negative feedback loop of second operational amplifier comprising a resistor/capacitor arrangement for stabilizing said feedback loop and restoring phase margin to said second operational amplifier.

7. An electronic circuit as set forth in claim 1, wherein said power supply circuit comprises a transformer for lowering voltage from an outside voltage source from 120 volts ac to 12 volts ac prior to passing into a rectifying portion for converting the voltage source from ac to dc, said power supply further comprising a pair of adjustable voltage regulators operably establishing power outputs of ±9 volts for input into a relay having switching capabilities with a pair of 9 volt batteries coupled thereto and an output coupled to said first and second and single operational amplifiers.

8. An electronic circuit as set forth in claim 1, wherein said spring reverberation device comprises a 3-spring configuration operable at an input impedance of 800 ohms and an output impedance of 2575 ohms.

9. An electronic circuit as set forth in claim 1, wherein said recovery amplifier circuit comprises an auxiliary jack fitted with a switch for clamping a signal to ground to intermittently control the external sound device.

10. An electronic circuit as set forth in claim 1, wherein said inverting input of second operational amplifier comprises a resistor/capacitor arrangement substantially serving as means for filtering a predetermined amount of high frequencies and limiting the extent of high frequency feedback at said inverting input of second operational amplifier particularly occurring upon said 50K linear potentiometer being set at a high resistive level.

11. A method for adding reverberation effects to an audio signal produced from an external high impedance device and passing the reverberated audio signal to an external sound device at a predetermined impedance, said method comprising the steps of:

sending the audio signal into an non-inverting input of a first operational amplifier having an inverting input shunted to ground and an output comprising a negative feedback loop coupled to said inverting input for setting said output at a predetermined gain and impedance prior to being passed into a non-inverting input of a second operational amplifier having an inverting input shunted to ground and a low impedance, high current output for input into a spring reverberation device having an output for passing therethrough a reverberated, low impedance signal, said negative feedback loop of first operational amplifier comprising a 50K linear potentiometer having variable resistive capacity to variably adjust gain of the audio signal and establish low impedance at said output of first operational amplifier;

passing the reverberated, low impedance signal into an inverting input of a single operational amplifier having a non-inverting input shunted to ground and an output

having a negative feedback loop coupled to said inverting input, said negative feedback loop of single operational amplifier comprising a 100K linear potentiometer having variable resistive capacity to variably adjust the audio signal's gain and establish a low impedance at said output of single operational amplifier prior to being fed into the external sound device; and

supplying power from an external source to a power supply circuit having means for switching between a dc voltage source and an ac voltage source most suitable for powering said first and second and single operational amplifiers.

12. A method as set forth in claim 11, wherein said negative feedback loop of second operational amplifier comprises a resistor/capacitor arrangement for stabilizing said feedback loop and restoring phase margin to said second operational amplifier.

13. A method as set forth in claim 11, wherein said inverting input of second operational amplifier comprises a resistor/capacitor arrangement substantially serving as means for filtering a predetermined amount of high frequencies and limiting the extent of high frequency feedback at said inverting input of second operational amplifier particularly occurring upon said 50K linear potentiometer being set at a high resistive level.

14. A method as set forth in claim 11, further comprising the step of coupling a switch at said non-inverting input of first operational amplifier for controlling the addition of reverberation to the audio signal and a reverberation effects bypass prior to said switch for maintaining the integrity and impedance of the audio signal for direct input into the external sound device.

15. A method as set forth in claim 11, wherein said spring reverberation device comprises a 3-spring configuration operable at an input impedance of 800 ohms and an output impedance of 2575 ohms.

16. An electronic circuit for adding reverberation effects to an audio signal produced from an external high impedance source and passing the reverberated audio

signal at a predetermined impedance for input into an external sound device, said electronic circuit comprising, in combination:

a first operational amplifier having inverting and non-inverting inputs and an output comprising a negative feedback loop coupled to said inverting input and shunted to ground, said negative feedback loop of first operational amplifier comprising a 50K linear potentiometer having variable resistive capacity to variably adjust the audio signal's gain and impedance at said output of first operational amplifier, said non-inverting input of first operational amplifier having an input jack for receiving therethrough the audio signal produced from the external high impedance source, said input jack comprising a reverberation effects bypass for maintaining the integrity and impedance of the audio signal produced by the external high impedance source for direct input into the external sound device;

a second operational amplifier having inverting and non-inverting inputs and an output comprising a negative feedback loop coupled to said inverting input and shunted to ground, said output of first operational amplifier being coupled to said non-inverting input of second operational amplifier having a filter coupled therebefore for blocking passage of dc signals while allowing passage of the audio signal into said second operational amplifier, said negative feedback loop of second operational amplifier comprising a resistor/capacitor arrangement for stabilizing said feedback loop and restoring phase margin to said second operational amplifier;

a spring reverberation device having an input for accepting a low impedance, high current signal from said output of second operational amplifier and an output for passing therethrough a reverberated, low impedance signal;

a single operational amplifier having an inverting input for receiving the reverberated, low impedance signal and a non-inverting input shunted to ground and an output comprising a negative feedback loop coupled to said inverting input, said negative feedback loop of single operational amplifier comprising a 100K linear potentiometer having variable resistive capacity to variably adjust the audio signal's gain and establish a

low impedance at said output of single operational amplifier prior to being fed into the external sound device; and

a power supply circuit having a transformer for lowering voltage from an outside voltage source from 120 volts ac to 12 volts ac prior to passing into a rectifying portion for converting the voltage source from ac to dc, said power supply circuit comprising a pair of adjustable voltage regulators operably establishing power outputs of ±9 volts for input into a relay having switching capabilities with a pair of 9 volt batteries coupled thereto and an output coupled to said first and second and single operational amplifiers.

17. An electronic circuit as set forth in claim 16, wherein said spring reverberation device comprises a 3-spring configuration operable at an input impedance of 800 ohms and an output impedance of 2575 ohms

18. An electronic circuit as set forth in claim 16, wherein said output of reverberation device comprises a resistor/capacitor arrangement substantially serving as means for rolling off high frequency gain from the reverberated, low impedance signal prior to being passed into said inverting input of single operational amplifier.

19. An electronic circuit as set forth in claim 16, wherein said output from said single operational amplifier comprises a capacitor to filter voltage spikes prior to passing the audio signal to the external sound device and a path to ground having resistive capacity to reinforce and increase the impedance of the audio signal from said output of single operational amplifier to substantially correspond to the impedance of the external sound device.

20. An electronic circuit as set forth in claim 16, wherein said non-inverting input of first operational amplifier comprises a switch for controlling the audio signal input and a path to ground comprising resistive capacity for maintaining a predetermined impedance into said first operational amplifier and keeping the external high impedance source from being loaded.